March 12, 1999 VPCD-99-04 (LDV/LDT/SM/ICI/LIMO)

Dear Manufacturer:

SUBJECT: Changes to EPA's Data Base; New Procedure to Schedule Vehicles for EPA Testing

Enclosure I provides an outline of recent changes which have been made to the Certification and Fuel Economy Information System (CFEIS) data base, plus some user tips and common data entry mistakes. The changes to the data base will accommodate the certification of 2000 model year vehicles to the optional CAP 2000 regulations, ref. NPRM published 63 FR 39653, July 23, 1998.

When scheduling vehicles for EPA confirmatory tests, manufacturers no longer need to submit an "EPA Testing Services Division Test Request Form;" ref. VPCD-98-07, May 5, 1998. EPA has implemented software changes which normally allow EPA certification team members to schedule these tests[1]. Manufacturers need only submit 1) CFEIS data to the EPA CFEIS data base, including complete and error free vehicle information and manufacturer test data; and 2) an EPA test request, ref. VPCD-99-01, January 11, 1999. Please be sure the test request contains the CFEIS test numbers of the manufacturer's tests performed on the test vehicle. Section 14.2 of Enclosure I outlines the CFEIS information necessary to schedule vehicles for EPA tests.

Enclosure I outlines CAP 2000 changes, new carline codes for minivans and SUVs, instructions for submitting flexible- and dual-fuel data, the fuel economy equation for ethanol-fueled vehicles, instructions for submitting engine displacement in liters for vehicles listed in the Fuel Economy Guide, and several other CFEIS changes.

Enclosure I does not contain changes to accommodate certification to the Supplemental Federal Test Procedure (SFTP) emission standards, which is optional for the 2000 model year. SFTP changes will be provided to the industry in a separate guidance letter, in the next month or so.

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[1]In rare cases, the manufacturer will still be required to submit these forms, e.g. if there are errors or incomplete information in the CFEIS data base.

Manufacturers are reminded to use the most current version of the CFEIS Manufacturers User Guide (CMUG) for guidance when submitting data to the EPA data base. It is available on the Internet on www.epa.gov/oms/cmug.htm, and is updated on a daily or weekly basis.

If you have any questions about this letter, please contact your certification team representative.

Sincerely,

Jane Armstrong, Director
Vehicle Programs and Compliance Division
Office of Mobile Sources

Enclosure

Enclosure I

OUTLINE OF RECENT CHANGES TO EPA'S DATA BASE

This document provides outline of some of the recent changes to EPA's Certification and Fuel Economy Information System (CFEIS) data base. Detailed instructions for entering CFEIS data are contained in the CFEIS Manufacturers User Guide, (CMUG) which is available on the Internet at www.epa.gov/oms/cmug.htm. Also included are some user tips, troubleshooting guidance, and common data entry mistakes.

1. Changes to CAFE Program:

Field Name	Record	Position	Description of change:
Engine Family/ Test Group Name		FF 62-73	Revised Field Name

2. Changes to Car Line Program:

Field Name	Record	Position	Description of change:
Class Code	C1	21-22	Added codes 20-24 for 2WD/4WD minivans, 2WD/4WD SUVs, and electric vehicles

3. Changes to the Engine System Information (ESI) Program:

Field Name	Record	Position	Description of change:
Engine Family/ Test Group Name		E1 5-16	Revised Field Name
Fuel System	E1	54-55	Added codes 12, 13, 14 for CAP2000 test groups
Valves per Cyl		E1 57-58	Added codes 9, 23, 24, 34, 45, 99 for multiple combinations of valves/cyl within a test group
Turbocharger turbocharger Supercharger a test group	E1	60-60	Added codes A, B, C, D for multiple & supercharger combinations within
Catalyst or Catalyst Construction (CAP 2000)	E1	62-63	Revised field name; added CAP2000 codes 9-16
CAP 2000	E1	91-91	Added new field to indicate that the test group was certified to CAP 2000 requirements
Input Record Type		ED all	Deleted ED record (formerly OBD description)
EERC Code	EE	5-6	Added exhaust emission-related component codes 91-96, 98
Projected Sales	E2	31-37	Deleted field

Actual Production		E2 39-45	Deleted field
DF Type	E2	47-47	Added code Z (Zed) for CAP2000 DFs
GVW Category	E2	49-54	Added codes FLD, CLD for CAP2000 LDV/LDT1 class
Vehicle Class		E2 56-57	Added code VT for CAP2000 LDV/LDT1 class

4. Changes to Evaporative/Refueling System Information (EvSI) Program:

Field Name	Record	Position	Description of change:
Input Record Type		PD all	Deleted PD record (formerly OBD description)

5. Changes to the General Label Program:

Field Name	Record	Position	Description of change:
Displacement in Liters	GM	21-24	Revised Field Name; revised from optional to required field; revised instructions for clarity
Optional Displacement Code	GM	26-26	Deleted field since the units of the previous record will always appear in “liters”
Engine Family/ Test Group Name		GF 62-73	Revised Field Name

6. Changes to the EPA/Manufacturer Test Data System (MTDS) Program:

Field Name	Record	Position	Description of change:
Unrounded Emission Results Name	TR	4-19	Deleted unnecessary “50-CO2" and “50-FE” codes. Added codes to allow the entry of methanol, ethanol and acetaldehyde emissions, which are needed to calculate the fuel economy of methanol and ethanol vehicles. Deleted all fuel economy related names except MFR-FE.

7. Changes to the Shift Schedule Program:

No changes noted.

8. Changes to the Summary Sheet Program:

Field Name	Record	Position	Description of change:
Engine Family/ Test Group Name		X1 9-20	Revised Field Name
Vehicle Type LDT1s Indicator Code for Summary Sheet	X1	54-56	Added code LVT; used only if both LDVs and are listed on the Summary Sheet

9. Changes to the Vehicle Information (VI) Program:

Field Name	Record	Position	Description of change:
Engine Family/ Test Group Name		V3 38-49	Revised Field Name
VI Fuel Type Code	VT	8-9	Updated fuel type codes, adding new codes for M10, M85, E10 (2 codes), E85 (2 codes).
Shift Schedule Database Code		VT 11-11 02,	Revised to a required field for test procedures 21, 25, 31, 35, 41, and 45.
Shift Schedule	ID	VT 13-16 02,	Revised to a required field for test procedures 21, 25, 31, 35, 41, and 45.

10. Vehicle Class Codes:

In order to accommodate certification of test groups which contain both light-duty vehicles (passenger cars) and light-duty trucks, code VT was added to Exhibit 4-2 contained in Section 4.3.5 of the CFEIS Manufacturers' User Guide. This code is used in the ESI program in the Vehicle Class field of the E2 card, column 56-57).

11. Fuel economy for ethanol-fueled vehicles:

In order to calculate the fuel economy of ethanol-fueled vehicles, the following equation is being added to section 8.4.2.5 of the CFEIS Manufacturers' User Guide:

8.4.2.5 Unrounded Unadjusted Fuel Economy Equation for Vehicles Tested on Ethanol Test Fuel:

$$UUFE_{effv} = [3781.8 \times CWF_{blend} \times SG_{blend}]/[(CWF_{EXHC} \times HC) + (0.429 \times CO) + (0.273 \times CO_2) + (0.375 \times CH_3OH) + (0.400 \times HCHO) + (0.521 \times C_2H_5OH) + (0.545 \times C_2H_4O)]$$

where: $UUFE_{effv}$ = unrounded unadjusted fuel economy
CWF = carbon weight fraction of the fuel
SG = specific gravity of the fuel
CWF_{EXHC} is assumed to be equal to CWF_{blend}
and emissions are expressed in grams/mile.

12. APPENDIX F EPA STANDARDIZED ENGINE AND EVAPORATIVE FAMILY NAMES:

In order to accommodate certification of test groups which contain both light-duty vehicles (passenger cars) and light-duty trucks, code "X" was added to character 5 of the engine family name. This code should only be used for CAP 2000 test groups which contain both vehicles and trucks.

13. Special Instructions for Submitting Flexible-Fuel and Dual-Fuel Data into CFEIS:

The following instructions are provided in order to submit test data from flexible-fueled and dual-fueled vehicles into CFEIS. These instructions will allow the data to be use for certification purposes (and listed on summary sheets); used to generate fuel economy labels and used for CAFE purposes.

13.1 ESI Program - Engine Family Subsystem:

Submit an engine family subsystem with both emission standard fuel types using the following record order: E2, (ES, EG's for first emission standard fuel type code), (ES, EG's for second emission standard fuel type code), ZZ, for example:

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E2 YTWXV01.8228 01 1      CL   10608         5 FLDV   V
ES  G   17
EG   50 C TLEV HC-TOTAL           0.41       1.0    0.026    N N N N
EG   50 C TLEV NMOG              0.1250      1.0    0.0192   N N N N
EG  100 C TLEV NMOG              0.1560      1.0    0.0400   N N N N
EG   50 C TLEV HCHO              0.0150      1.0    0.0001   N N N N
EG  100 C TLEV HCHO              0.0180      1.0    0.0002   N N N N
EG   50 C TLEV CO                3.40       1.0    0.49     N N N N
EG  100 C TLEV CO                4.20       1.0    1.02     N N N N
EG   50 C TLEV NOX               0.40       1.0    0.13     N N N N
EG  100 C TLEV NOX               0.60       1.0    0.26     N N N N
EG   50 C TLEV NOX-HWY           0.50       1.000  0.07     N N N N
EG  100 C TLEV NOX-HWY           0.80       1.000  0.14     N N N N
EG   50 C N/A  CO-COLD           10.0       1.0    0.49     N N N N
ES  M   17
EG   50 C TLEV HC-TOTAL           0.41       1.0    0.026    N N N N
EG   50 C TLEV NMOG              0.1250      1.0    0.0211   N N N N
EG  100 C TLEV NMOG              0.1560      1.0    0.0440   N N N N
EG   50 C TLEV HCHO              0.0150      1.0    0.0011   N N N N
EG  100 C TLEV HCHO              0.0180      1.0    0.0022   N N N N
EG   50 C TLEV CO                3.40       1.0    0.48     N N N N
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EG  100 C TLEV CO                4.20       1.0    1.00     N N N N
EG   50 C TLEV NOX               0.40       1.0    0.13     N N N N
EG  100 C TLEV NOX               0.60       1.0    0.26     N N N N
EG   50 C TLEV NOX-HWY           0.50       1.000  0.10     N N N N
EG  100 C TLEV NOX-HWY           0.80       1.000  0.20     N N N N
EG   50 C N/A  CO-COLD           10.0       1.0    0.48     N N N N
ZZ
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13.2 Vehicle Information Program:

Submit two VF records with the VI submission (one for each emission standard fuel type code), and two sets of VT records (one set for each vehicle fuel type that are associated with the emission standard fuel type codes on the two VF records). Using the example above, submit a VF record using ‘M’ and a VF record using ‘G’ and a set of VT records using vehicle fuel type 6 and a set of VT records using vehicle fuel type 33.

13.3 MTDS Program:

Submit separate tests for each vehicle fuel type code that are associated with the emission standard fuel type codes on the two VF records, using the example above submit a set of tests using vehicle fuel type 6 and a set of tests using vehicle fuel type 33.

13.4 General Label Program:

Enter gasoline data and alternative fuel data into separate indexes. A common carline name should be used for both sets of data, e.g. “ALASKA TRUCK FFV 2WD.” In the comment field, list the driving range of each model type for the applicable fuel type, ref. manufacturer guidance letter VPCD-98-11, September 30, 1998. Also in the comment field, list the pair of index numbers, which together will comprise the gasoline and alternative fuel general label mpg values for the applicable model types to be listed in the Fuel Economy Guide.

13.5 CAFE Program:

Enter alternative fueled data into the data base using test type 32 (analytical) data. In the future, we may make changes which will allow the use of the MDTS gasoline and alternative fueled data. Instructions will be provided at that time.

14. Tips for Entering Data into the Data Base:

The CFEIS data base is quite sensitive to the order in which data are entered into the various programs. It is easy to correct mistakes immediately after entering data into each program. However, successive programs build on the previous data and it becomes increasingly difficult to go back several steps and correct mistakes in data which was entered early in the process. The following order should be used:

14.1. Data should first be entered into any of the following:

- Carline Program
- Shift Schedule Program
- Engine System Information (ESI) Program
- Evaporative/Refueling System (EvSI) Program

Data may be entered in any order for these programs. Please review output reports carefully for errors, and correct all errors before going on to the next step. Especially make sure that the emission standards, deterioration factors (DFs), and the sales area(s) are listed correctly on the ESI and EvSI output reports.

14.2. Next, data should be entered into the following program:

- Vehicle Information (VI) Program

Be sure the Design Equivalent Test Weight in the V2 record is correct. Be sure that the information in the VT record is correct (for each combination of Test Procedure Code and Fuel Type which will be used) as this information will be needed to schedule any possible confirmatory tests at EPA. [The VT record includes the Shift Schedule Database Code, Shift Schedule ID, Shift Indicator Light, Side Fan Cooling Code, Manufacturer Coastdown Time, Actual Dyno Horsepower, and the various Electric Dynamometer Coefficients, which must be correct in order to perform EPA tests.] Do not enter a VT record for unnecessary combinations of Test Procedure Code and Fuel Type as this may cause errors and over populates the data base. For example, please do not enter VT records (as one manufacturer did) for the following incorrect combinations of test procedure and fuel types:

Test Procedure	Fuel Type	Comment
02	24,25	Fuel type 24,25 is only for Cold CO tests.
17, 36	All	Test procedures 17 and 36 are obsolete.
21, 31	25	Fuel type 25 is only for Cold CO tests
23	23	Test procedure 23 uses fuel type 6, only.
47	23	Test procedure 47 is rarely used.
76	6,24,25	Test procedure 76 is rarely used at EPA.

Please review the VI output reports carefully and correct all errors before going on to the next step.

14.3. Next, data should be entered into the following program:

- Manufacturers Test Data System (MTDS) Program

Review the MTDS output report to be sure that certification levels (pass/fail results) are listed on the output for all emission constituents and all applicable sales areas which will

be listed on the Summary Sheet. MTDS data may be entered for other vehicle/configurations any time after the VI data for that vehicle/configuration has been entered. Please review output reports carefully, and correct all errors before going on to the next step.

14.4. Next, data should be entered into the following program:

Summary Sheet Program.

Each Summary Sheet should contain all official test data[2] used to support certification, including exhaust data from the emission data vehicles in the engine family (test group); evaporative/refueling data, including 2-day, 3-day, and spitback[3] or ORVR data; Cold CO data; Certification Short Test data[4]; idle CO data[4]; 50°F test data[5]; Highway NOx data[5]; and SFTP data (if applicable).

14.5. After any summary sheet errors are corrected, data may be entered into the following program:

- Fuel Economy Label Program

Data may actually be entered into the Fuel Economy Label Program after the MTDS data, however some mistakes may appear in the Summary Sheet Program which were not readily apparent when entering MTDS data . For this reason, it is a good idea to submit fuel economy labels after the summary sheets have been corrected.

14.6 Next, data may be entered into the following program:

- CAFE Program

Submitting CAFE data is the last step of the process, and normally occurs just prior to March 31, in the next calendar year

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[2]Manufacturer's retest criteria and official use of EPA confirmatory test data is outlined in Advisory Circular 84A. Normally, the last manufacturer's test is the official test for certification purposes, unless EPA confirmatory testing is performed. If EPA confirmatory testing is performed, the first EPA test normally becomes the official test data for certification purposes.

[3]Spitback data are not required for California-only summary sheets or if certified to ORVR emission standards.

[4]As proposed in the CAP 2000 NPRM, Certification Short Test test data and light-duty truck idle CO data are not required to be listed on the summary sheet for Cap 2000 test groups, if the manufacturer provides corresponding statements of compliance in their application.

[5]50°F and Highway NOx test data are not required for Tier 1 engine families (test groups). 50°F test data is only required for some NLEV engine families (test groups).

after production has ended, long after summary sheets and fuel economy labels have been entered into the data base. Test data for running change and CAFE vehicle/configurations may be entered at any time (by going back to steps 2 and 3 of the process).

15. Common Data Entry Mistakes and Tips for Troubleshooting Errors Messages:

Keep records of all input and all output so that you may refer back to them if necessary. When errors occur, try to do some troubleshooting before calling the EPA data staff. Read the output messages. Take a look at the latest version of the CMUG on www.epa.gov/oms/cmug.htm to see if you have followed the most current input instructions. If you need EPA help, you can contact the following EPA personnel:

Kassem Abbas	(734) 214-4437
Karen Danzeisen	(734) 214-4444
John Hendon	(734) 214-4383
Seung Park	(734) 214-4226

Common mistakes include the following:

- Sometimes manufacturers input the alphabetical letter “O” in engine family names instead of a “0" (zero). Only the number “0" (zero) should be used in engine family names. This is a common error throughout the CFEIS system.

- Although many fields in CFEIS are optional, manufacturers should still enter data if possible. For example, data should be entered in the following fields:

    - the Exhaust Emission Related Components (EERC) codes (EE record in the ESI program);
    - the Test Date (T1 record in MTDS);
    - the Odometer Reading (T2 record in MTDS);
    - Engine Code (V3 record in the VI program); and
    - Exhaust Emission Control System (V3 record in VI).

- When submitting MTDS data, look over the output report carefully, to be sure that certification levels (pass/fail values) appear for both intermediate useful life and full useful life emission standards (if applicable). Make sure all emission constituents are reported correctly, along with the deterioration factors, and emission standards for each constituent. Be sure that accurate fuel economy (mpg) values appear on the report.

- For Tier 1 and NLEV engine families/test groups, manufacturers are not required to enter total HC emission values, HC deterioration factors, and HC emission standards into the CFEIS data base, ref 40 CFR 86.095-23(c). However total HC emission values should still be reported in MTDS, since they are needed for fuel economy calculations.

- For NLEV vehicles, the method of rounding emission test results is different when determining compliance with emission standards, ref. 40 CFR 86.1728-99 (g). As explained in VPCD-98-03, April 8, 1998, manufacturers should

report the 1999 and later model year NLEV emission standards listed on the ESI and EvSI to one decimal place beyond the value of the actual emission standard, for all NLEV emission standards except total HC, OMHCE, Spitback, Cold CO, and high altitude data (if supplied). The emission standards for total HC, OMHCE, Spitback and Cold CO should be reported to the same number of significant figures as the actual emission standard. This rounding method will have a minor effect on fuel economy mpg calculations, since the CO emissions value used in the equation to calculate the rounded mpg value will be carried out to one more significant figure than actually required. However, reporting a more accurate CO emission value will have no effect on the mpg value, except in extremely rare cases. Manufacturers may contact EPA to correct any incorrectly rounded mpg values on a case-by-case basis.

- NMOG mass emission values reported to EPA should be “adjusted” NMOG values, which include the reactivity factor (RAF) and the methane RAF (natural gas vehicles only). For additive NMOG deterioration factors (DFs), the DF should also include the effect of the RAF.

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